WHAT IS CLAIMED IS:

1. A method of compensation for frequency complex up-conversion phase and gain impairments in an up/down conversion transceiver, the method comprising:

estimating gain and phase imbalance parameters in receive mode during transceiver power-up;

canceling the receive mode gain and phase imbalance in response to the estimated parameters;

switching the transceiver to transmit mode subsequent to cancellation of the receiver gain and phase imbalance;

transmitting a signal back into the receiver via the transceiver transmitter subsequent to switching to the transmit mode;

re-estimating gain and phase imbalance parameters subsequent to transmission of the signal back into the receiver, and generating transmit mode gain and phase impairments there from; and

canceling transmit mode gain and phase imbalance in response to the estimated impairments.

2. The method according to claim 1, wherein the receive mode gain and phase parameters are selectively estimated in response to amplified noise or an external test signal.

3. The method according to claim 1, wherein the receive mode gain and phase parameters are selectively estimated in response to a received passband input signal.

4. The method according to claim 1, wherein the receive mode gain and phase imbalance is canceled in a feed forward manner.

5. A up/down conversion transceiver comprising:

an analog down converter operational in association with a plurality of A/D converters to generate in-phase signals and quadrature signals in response to passband RF input signals;

a digital gain equalizer operational in response to the in-phase and quadrature signals to cancel a estimated receive gain error when the transceiver is in receive mode and further operational to estimate a transmit gain error when the transceiver is in transmit mode;

a digital phase estimator operational in response to the in-phase and quadrature signals to generate a estimated receive phase error when the transceiver is in receive mode and further operational to estimate a transmit phase error when the transceiver is in transmit mode;

a receiver digital phase equalizer operational to cancel the estimated receive phase error; and

a transmitter operational to generate up-converted passband RF input signals having canceled transmit gain and phase imbalances in response to the passband RF input signal, the estimated transmit gain error and the transmit phase error.

6. The up/down conversion transceiver according to claim 5, wherein receive and transmit portions of the transceiver are configured to operate with the same local oscillator frequency and are further configured to operate with independent phase and gain impairments.

7. A up/down conversion transceiver comprising:

a receiver operating at a local oscillator frequency; and

a transmitter operating at the local oscillator frequency, wherein the receiver and transmitter, independently of one another, are each configured to cancel its respective gain and phase impairments.

8. The up/down conversion transceiver according to claim 7, wherein the receiver comprises:

an analog down converter operational in association with a plurality of A/D converters to generate in-phase signals and quadrature signals in response to passband RF input signals;

a digital gain equalizer operational in response to the in-phase and quadrature signals to cancel a estimated receive gain error when the transceiver is in receive mode and further operational to estimate a transmit gain error when the transceiver is in transmit mode;

a digital phase estimator operational in response to the in-phase and quadrature signals to generate a estimated receive phase error when the transceiver is in receive mode and further operational to estimate a transmit phase error when the transceiver is in transmit mode; and

a receiver digital phase equalizer operational to cancel the estimated receive phase error.

9. The up/down conversion transceiver according to claim 8, wherein the transmitter is operational to generate up-converted passband RF input signals having canceled transmit gain and phase imbalances in response to the passband RF input signal, the estimated transmit gain error and the transmit phase error.

10. The up/down conversion transceiver according to claim 7, wherein the receiver comprises:

means for generating in-phase signals and quadrature signals in response to passband RF input signals;

means responsive to the in-phase and quadrature signals for canceling a estimated receive gain error when the transceiver is in receive mode and for estimating a transmit gain error when the transceiver is in transmit mode;

means responsive to the in-phase and quadrature signals for generating a estimated receive phase error when the transceiver is in receive mode and for estimating a transmit phase error when the transceiver is in transmit mode; and

means for canceling the estimated receive phase error.

11. The up/down conversion transceiver according to claim 10, wherein the means for generating in-phase signals and quadrature signals comprises an analog down converter operational in association with a plurality of A/D converters.

12. The up/down conversion transceiver according to claim 11, wherein the means means responsive to the in-phase and quadrature signals for canceling a estimated receive gain error comprises a digital gain equalizer.

13. The up/down conversion transceiver according to claim 12, wherein the means responsive to the in-phase and quadrature signals to generate a estimated receive phase error comprises a digital phase estimator.

14. The up/down conversion transceiver according to claim 13, wherein the means for canceling the estimated receive phase error comprises a receiver digital phase equalizer.

15. A up/down conversion transceiver comprising:

a receiver operating at a local oscillator frequency;

a transmitter operating at the local oscillator frequency; and

algorithmic software, wherein the receiver and transmitter operate independently of one another in response to the algorithmic software such that the receiver and transmitter each cancel only its respective gain and phase imbalances.